Conroy, David

From: Judge, Robert
Sent: Friday, December 02, 2016 3:55 PM
To: Pirolli, Ric; Kiernan.Wholean@ct.gov
Cc: Conroy, David; Arnold, Anne; Van Arsdale, Alan; Taylor, Catherine; McWilliams, Anne K.; Kahn, Peter R.; Burkhart, Richard
Subject: Preliminary feedback on CT's EE analyses

Ric-

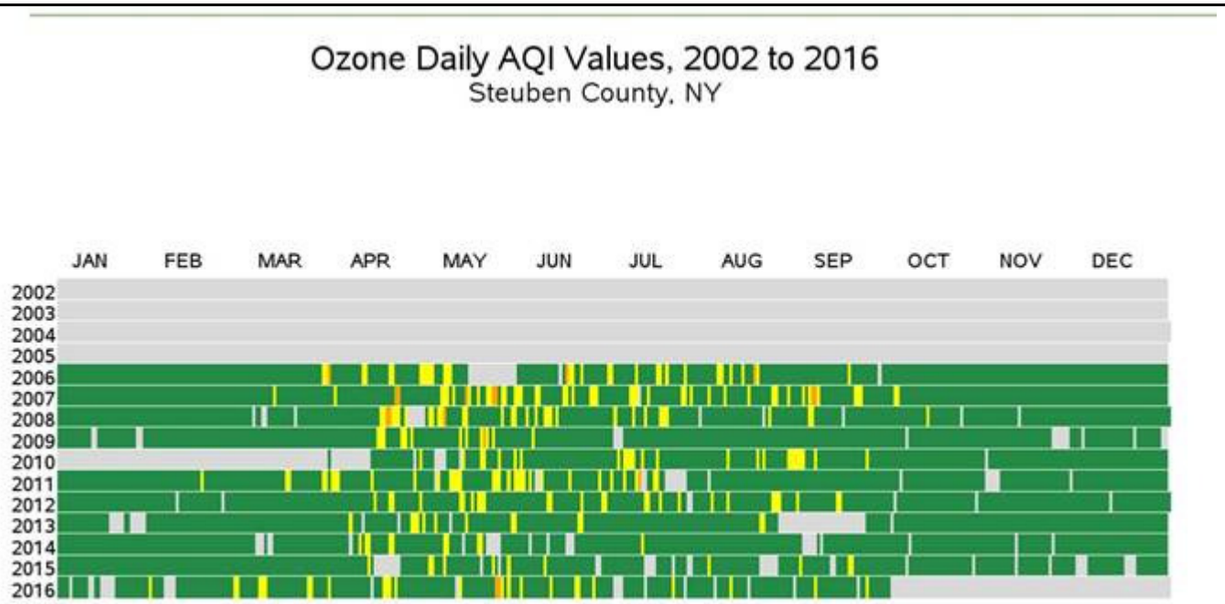
Thank you again for your PowerPoint presentation from November 4 demonstrating your observations in the wake of the Fort McMurray fire. As you know, Dave Conroy responded to Anne Gobin on November 17 on your initial notification. We have subsequently reviewed the information you provided, including the PowerPoint slides from November 4 and your initial notification from September 28, and have some preliminary feedback on your analyses.

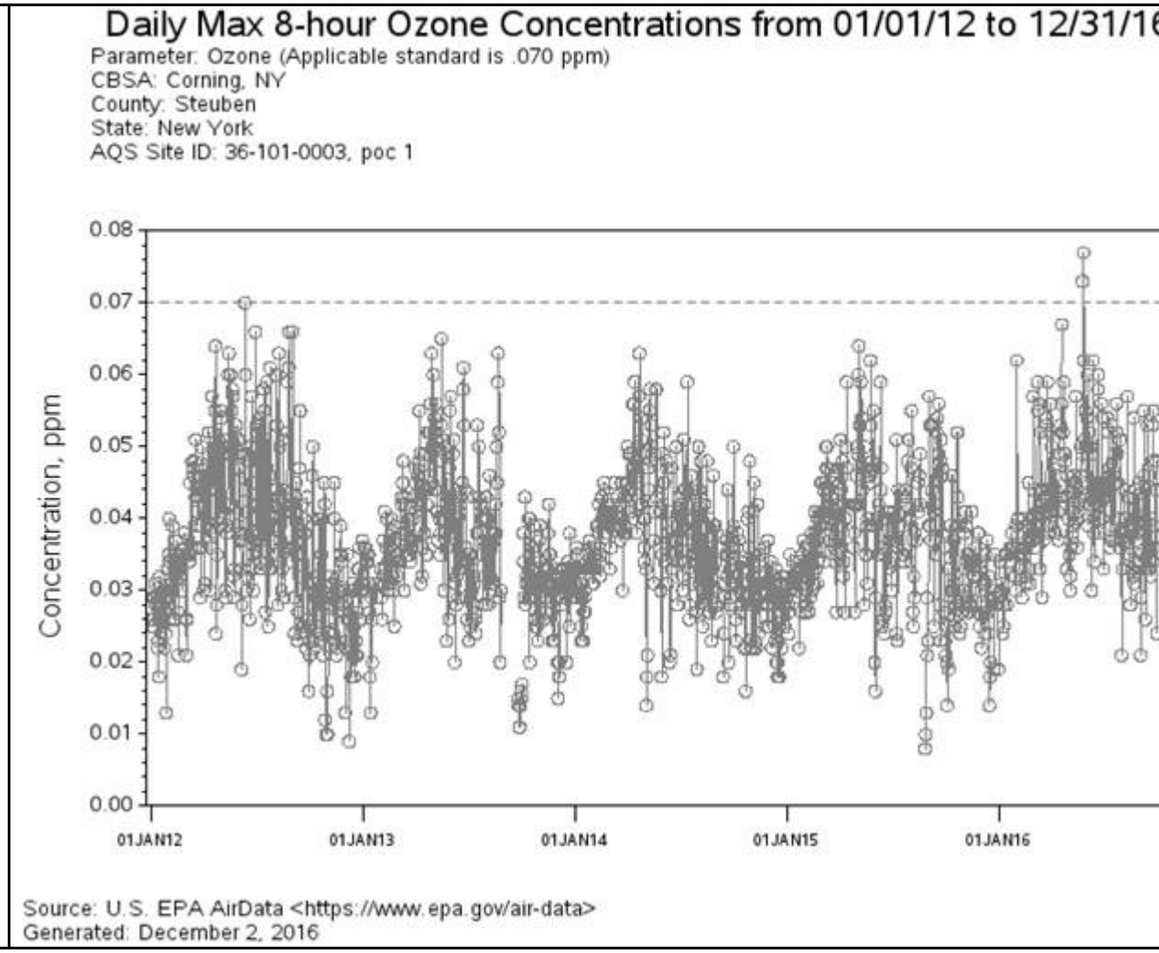
We expect to discuss this topic with Headquarters next week, and intend to discuss all of the documentation we will need from you in order to render a final decision regarding your request. We expect to be able to provide final feedback to you in mid December, which will give you plenty of time prior to the May 31st deadline. In the meantime, we recommend you look closely at EPA's guidance document entitled "Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations."

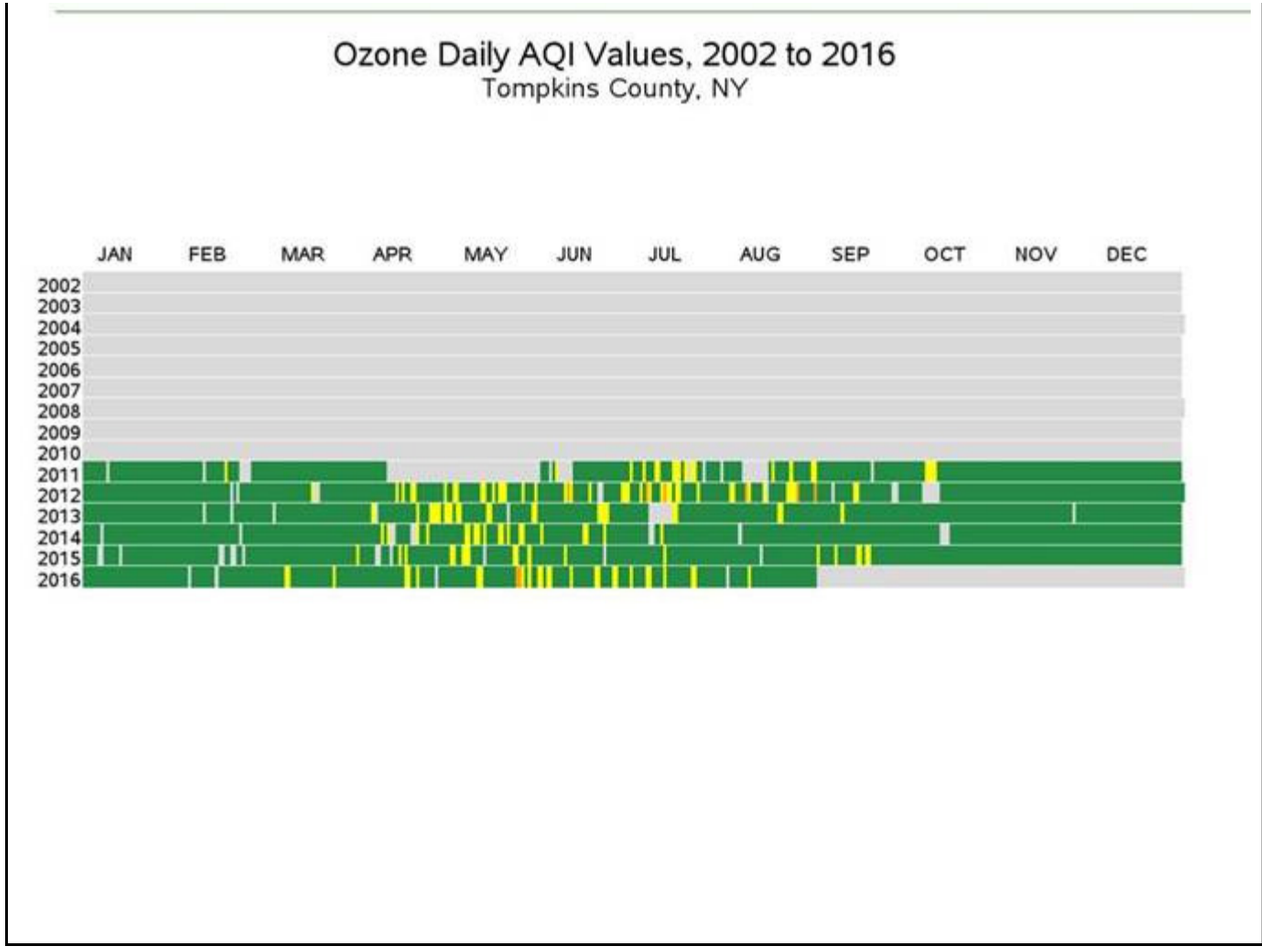
As you know, pages 7-30 provide specific recommendations/suggestions on what types of analyses could be useful for establishing clear causality. Note the tier sequencing, starting with Tier 1 analyses, building to Tier 2, and then Tier 3, *if necessary* to establish clear causality. Given the distance of the Fort McMurray fire from the monitors in the Northeast, advanced analyses will be necessary to demonstrate that the Fort McMurray is the primary reason for the high ozone concentrations recorded in Connecticut during the episode and that normal precursor emissions from the Northeast urban corridor was likely *not* the cause.

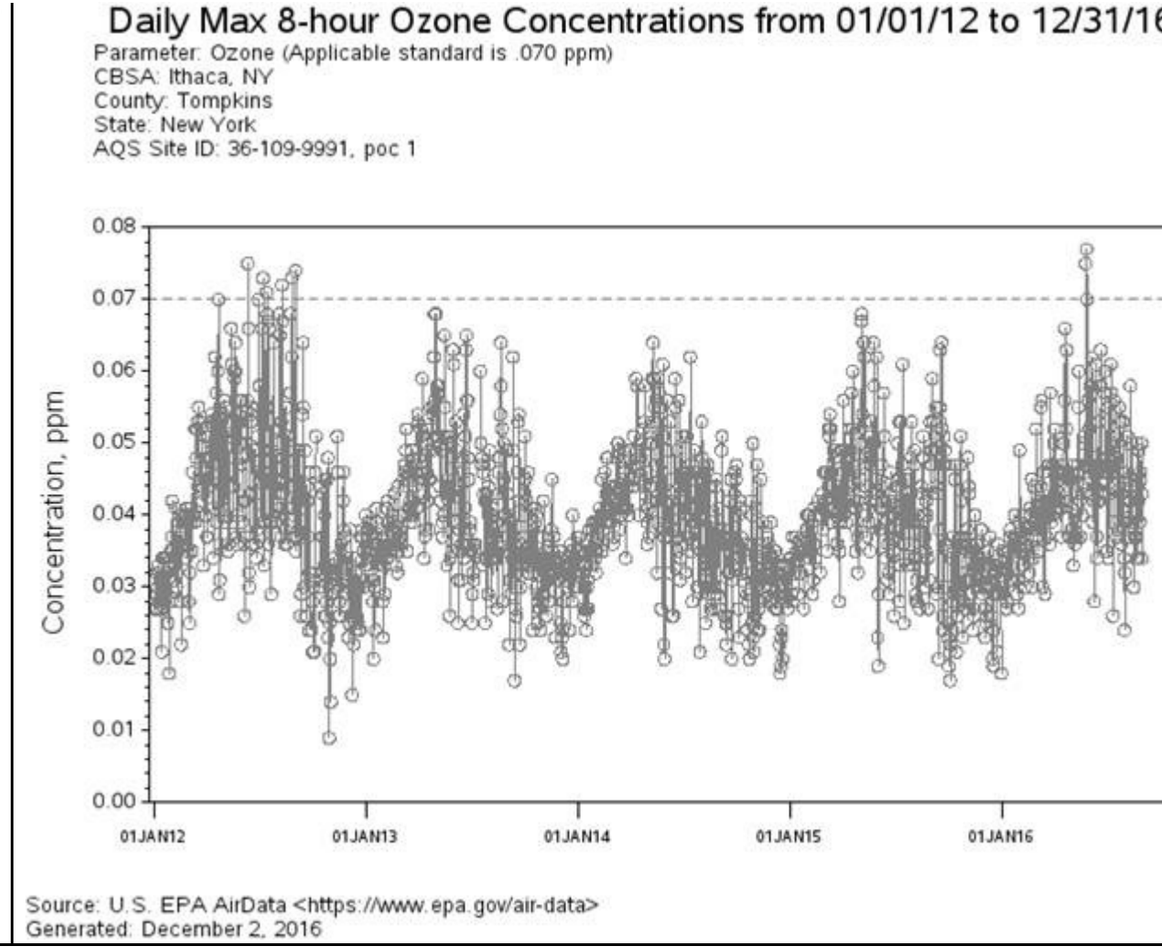
At this time, we believe that working on a narrative description of the event, noting exactly what happened and why ozone monitors in the Northeast recorded elevated ozone concentrations will be critical for your final Exceptional Events (EE) demonstration. Part of this may include documenting the progression of the higher ozone concentrations as they are transported eastward by providing examples of elevated ozone concentrations in the Midwest, Canada and Upstate New York prior to the arrival of the smoke/ozone event in Connecticut. Page 8 of the wildfire guidance includes explicit information which we recommend be included in the narrative conceptual model.

Slide 31 of your PowerPoint presentation currently shows the max 8-hour ozone concentrations during May and June of 2009 through 2016 for all 12 of the ozone monitors in Connecticut. We think it would helpful to expand these analyses in your final EE demonstration to include the full ozone seasons for these years. As you know, EPA guidance suggests the comparison of the event-related ozone concentrations with non-event related high ozone concentrations involves showing that the exceedances due to the exceptional event are in the 99th or higher percentile of the 5-year distribution of ozone monitoring data, or is one of the four highest ozone concentrations within 1 year. Although meeting these criteria may be difficult for all of the ozone monitors in Connecticut, you may be able to show that the high ozone concentrations measured directly upwind during episode in western Massachusetts, southern Vermont and upstate New York were truly unique over the last 5-8 years. For example, tile plots and ozone concentration plots generated with EPA's Air Data web site for Corning and Ithaca, NY appear to confirm this for these locations. (See below.) As such, we think including an analysis of what was happening in these upwind areas (similar to what was done in Slide 31) may make the demonstration that Connecticut's ozone during the episode was exceptional more compelling.


Ozone Daily AQI Values, 2002 to 2016
Steuben County, NY
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

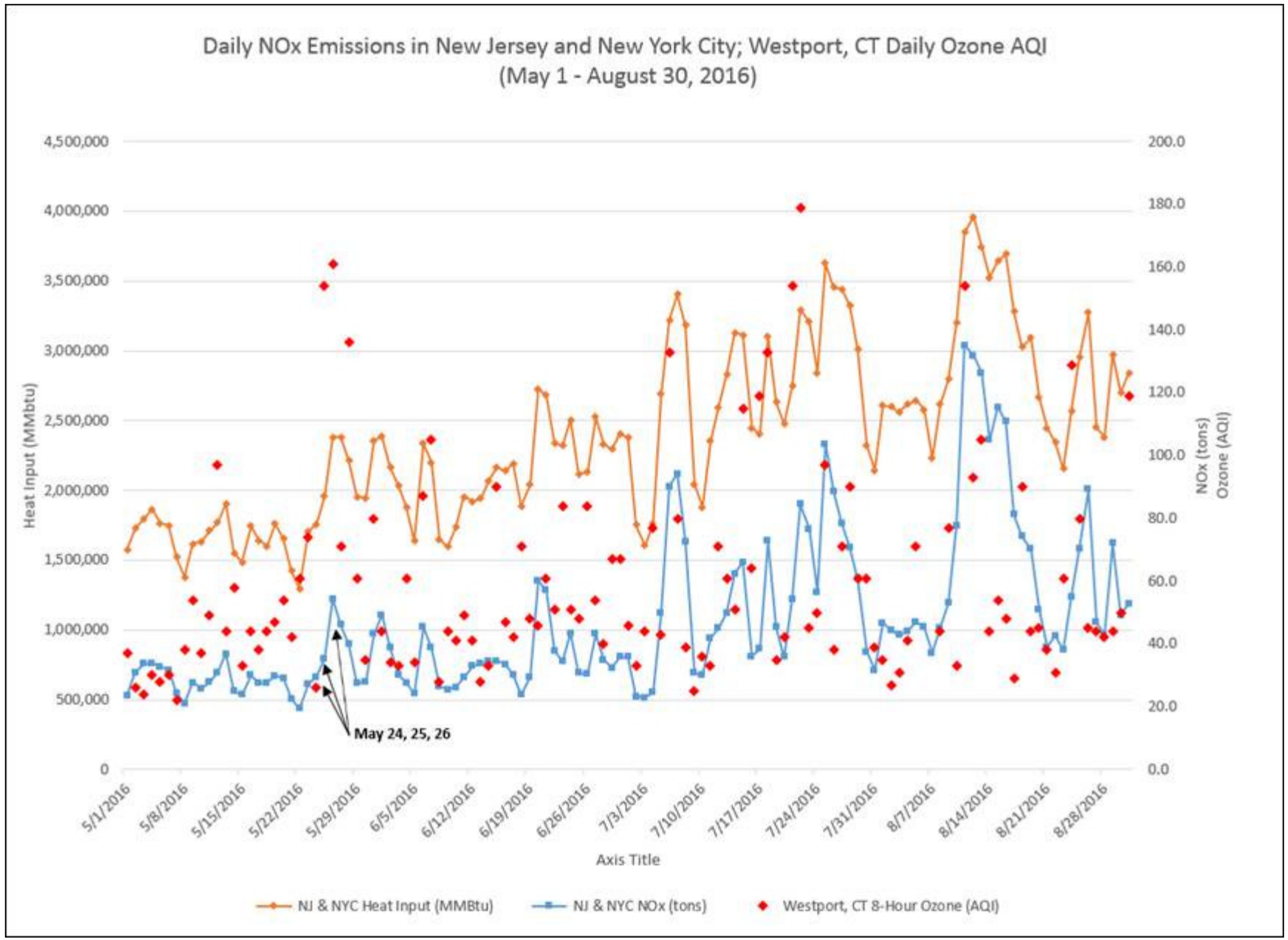

Daily Max 8-hour Ozone Concentrations from 01/01/12 to 12/31/16
Parameter: Ozone (Applicable standard is .070 ppm)
CBSA: Corning, NY
County: Steuben
State: New York
AQS Site ID: 36-101-0003, poc 1
Concentration, ppm
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
01JAN12
01JAN13
01JAN14
01JAN15
01JAN16
Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: December 2, 2016





Moreover, we think a comparison of ozone concentrations on meteorologically similar days over the last 5-8 years is critical to your EE demonstration. For example, CT DEEP could look for warm summer days in the past with similar 24-hour back trajectories from southwestern Connecticut originating in western New York, and analyze the ozone concentrations on those days. In addition, CT DEEP could do an ensemble of back trajectories for all days during a given time period (e.g., 3-5 year period) when high ozone was measured in CT. This could also be compelling way to demonstrate that high ozone measured in CT typically comes from a different source region than what was occurring during the May 2016 event (i.e., CT's ozone typically originates from the DC-Balt-Philly-NYC corridor).

Slides 33-35 of the November 4th presentation show wind roses versus ozone concentrations for 3 years for Cornwall. We believe it would be useful to provide these data for more years (e.g., 5-8 years) and for other ozone monitors in Connecticut. At a minimum, you should provide these plots for every ozone monitor for which you are seeking an exceptional event "approval" from EPA. For the coastal Connecticut locations during May 25 and 26, these wind roses may be less conclusive and further analysis of the origins of the precursor emissions affecting the coastal monitors on these days may be necessary. For example, CT DEEP could look at the NOx sources covered by the Cross State Air Pollution Rule (CSAPR) in the immediate upwind areas on these days compared to what typically happens during a severe ozone event in July or August. A quick analysis for 2016 for sources in New Jersey and the counties in downstate New York show that daily emissions on May 24-27 (especially May 24 &25) were much lower than later in the summer during ozone events (e.g., July 7, July 22, Aug 11-13). (See graph below.)



Further, the graphs on slides 37 and 38 show increasing CO, $PM_{2.5}$, BC and delta C as ozone increases, suggesting that smoke was in the air, and that was the cause/contributing factor for elevated ozone at Cornwall. CT DEEP should provide another series of graphs for Cornwall, which show what is typically measured at this site for these parameters during periods of elevated ozone

concentrations. Presumably it would show a different scenario for CO, $PM_{2.5}$, delta C and BC, and a different region of origin. In addition, other monitoring sites in Connecticut such as East Hartford, Hartford (Huntley Place), and New Haven would all have this information available, based on their current suite of monitors. Making similar demonstrations (with "smoke" and without smoke) for these monitoring locations would further bolster CT's case. A demonstration for Danbury and Groton relative to $PM_{2.5}$ and ozone may also be beneficial.

Please note that the suggestions above are based on your initial notification, where you indicated that all data from all ozone monitors operated by CT had been flagged for the all of May 25-29, 2016. The November 4th presentation by CT DEEP largely focuses on Cornwall and Westport, and suggests that May 25 and 26 were more significant. This presentation concludes with *"All evidence points to flagging some or all of May 25-29, 2016 as an exceptional event."* We believe it is critical that the final exceptional event request submission *to EPA* be explicit about which monitors and days an EE designation is requested, and also provide documentation that substantiates the request for all hours for all monitors for which the request is sought.

After today, I will be out of the office until December 8th. If you have any questions, please contact Catie Taylor at 617-918-8607 or Anne McWilliams at 617-918-1697. We will be back in touch soon after we further discuss with our EPA counterparts in HQ.

Thanks,
Bob Judge

Robert Judge
Air Monitoring Coordinator (ECA)
EPA- New England Regional Laboratory
11 Technology Drive
North Chelmsford, MA 01863-2431
617-918-8387 (phone)
617-918-8287 (fax)